



NOAA FISHERIES

PROPOSED ACTION: Issuance of a Rulemaking and Subsequent Letters of Authorization to the City of Seattle's Department of Transportation to Take Marine Mammals by Harassment Incidental to the Elliott Bay Seawall Project in Seattle, Washington, September 2013 to September 2018.

TYPE OF STATEMENT: Environmental Assessment

LEAD AGENCY: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

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LOCATION: Elliott Bay, along the coast of Seattle, Washington.

ABSTRACT: This Environmental Assessment analyzes the environmental impacts of the National Marine Fisheries Service, Office of Protected Resources, Permits and Conservation Division's proposal to issue an Incidental Harassment Authorization to the City of Seattle's Department of Transportation for the taking, by Level B harassment, of small numbers of marine mammals, incidental to the Elliott Bay Seawall Project in Seattle, Washington, September 2013 to September 2018.

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LIST OF ABBREVIATIONS OR ACRONYMS

BiOp	Biological Opinion
CFR	Code of Federal Regulations
Commission	Marine Mammal Commission
dB	decibel
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973 (16 U.S.C. 1531 <i>et seq.</i>)
FONSI	Finding of No Significant Impact
FR	<i>Federal Register</i>
ft	feet
IHA	Incidental Harassment Authorization
ITS	Incidental Take Statement
km	kilometer
m	meter
mi	mile
MMPA	Mammal Protection Act of 1972, as amended (16 U.S.C. 1631 <i>et seq.</i>)
μPa	microPascal
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act of 1969 (42 U.S.C. 4321 <i>et seq.</i>)
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
Project	Elliott Bay Seawall Project
PSO	Protected Species Observer
SDOT	City of Seattle's Department of Transportation

EXECUTIVE SUMMARY

The National Marine Fisheries Service (NMFS), Office of Protected Resources, Permits and Conservation Division has prepared this environmental assessment (EA) pursuant to the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*), the Council on Environmental Quality regulations in 40 CFR §§ 1500-1508, and NOAA Administrative Order 216-6.

ES.1 Description of the Proposed Action

We (National Marine Fisheries Service, Office of Protected Resources, Permits and Conservation Division) propose to issue an Incidental Harassment Authorization (Authorization) to the City of Seattle's Department of Transportation (SDOT) under the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1631 *et seq.*) for the incidental taking of small numbers of marine mammals, incidental to the Elliott Bay Seawall Project (Project) along the Seattle, Washington shoreline, September 2013 to September 2018. We do not have the authority to permit, authorize, or prohibit SDOT's construction in Elliott Bay.

Our proposed action is a direct outcome of SDOT requesting an authorization to take marine mammals, by harassment, incidental to the Project. Pile driving activities associated with SDOT's construction, which have the potential to cause marine mammals to be behaviorally disturbed, warrant an incidental take authorization from us under section 101(a)(5)(A) of the MMPA.

ES.2 Scope of this Environmental Assessment

This EA titled, *Issuance of a Rulemaking and Subsequent Letters of Authorization to the City of Seattle's Department of Transportation to Take Marine Mammals by Harassment Incidental to the Elliott Bay Seawall Project in Seattle, Washington, September 2013 to September 2018*, focuses primarily on the environmental effects of authorizing the take of marine mammals incidental to SDOT's activities.

To evaluate the potential effects of the Project, Tetra Tech, Inc. has prepared a Biological Assessment (BA) and a Fish, Wildlife, and Vegetation Discipline Report for SDOT (Tetra Tech, Inc., 2012a; Tetra Tech, Inc., 2012b). We do not duplicate their analyses; rather we incorporate them by reference as explained further in this document. The U.S. Army Corps of Engineers (ACOE) is also preparing an EA for this project, but it will not be complete in time for us to adopt it. Tetra Tech's BA and the Fish, Wildlife, and Vegetation Discipline Report were used to inform this EA. Last, we published a notice for the proposed Authorization in the *Federal Register* (78 FR 22096, April 12, 2013; (NMFS, 2013)) which provided a detailed description of the proposed activity and environmental information and issues related to it. We also incorporate that notice by reference.

We have prepared this EA to assist in determining whether the direct, indirect, and cumulative impacts related to our issuance of an Authorization under the MMPA for marine mammals for the Project is likely to result in significant impacts to the human or natural environment. This EA is intended to inform our decision on issuing the Authorization. While the focus of this EA is on the effects caused by the proposed issuance of an Authorization, in combining this analysis with the analyses in the previously referenced documents, we have considered all impacts associated with the underlying action which is the full suite of activities conducted for their proposed Project. We anticipate the issuance of an Authorization to take small numbers of marine mammals incidental to

SDOT's specified activities in a specific geographic region to affect marine mammals and their habitat.

Our NEPA analysis further evaluates effects to marine mammals and their habitat due to the specific scope of the decision for which we are responsible (*i.e.*, whether or not to issue the Authorization which includes prescribed means of incidental take, mitigation measures, and monitoring requirements). Our review of public comments submitted in response to our notice for the proposed Authorization in the *Federal Register* (78 FR 22096, April 12, 2013) did not reveal additional environmental impacts or issues requiring analysis in this EA.

ES.3 Alternatives

Our Proposed Action (Alternative 1, Preferred Alternative) represents the Authorization of take incidental to the applicant's Project, along with required monitoring and mitigation measures for marine mammals that would minimize potential adverse environmental impacts. The Authorization includes prescribed means of incidental take, mitigation and monitoring measures, and reporting requirements.

For the No Action Alternative, we would not issue an Incidental Harassment Authorization to SDOT for the taking, by Level B harassment, of small numbers of marine mammals, incidental to the Project.

- The No Action Alternative also includes the full suite of activities conducted by SDOT for the Project. Because we do not have the authority to permit, authorize, or prohibit the Project itself, SDOT may decide to: (1) continue with the Project with the inclusion of mitigation and monitoring measures sufficient to preclude any incidental take of marine mammals; (2) continue the Project and be in violation of the MMPA if take of marine mammals occurs; or (3) choose not to conduct the Project.
- For purposes of this NEPA analysis, however, we characterize no action as the applicant's implementation of the Project without the mitigation and monitoring measures for marine mammals prescribed in the Authorization for incidental take in order to sharply compare and contrast the environmental effects of the alternatives.

Alternative 2 includes all elements of the Preferred Alternative and considers additional mitigation measures, including the implementation of ramp-up procedures after 15 minutes following delay or shutdown because of pinniped presence; and an exclusion zone for large whales with a radius of 6,276 m (3.9 miles) to encompass the entire Level B harassment zone during vibratory pile driving.

ES.4 Environmental Impacts of the Proposed Action

SDOT's proposed activities would involve pile driving that has the potential to cause marine mammals to be behaviorally disturbed.

- The impacts of conducting the Project on marine mammals are specifically related to acoustic activities, and these are expected to be temporary in nature, negligible, and would not result in substantial impacts to marine mammals or to their role in the ecosystem.
- The Preferred Alternative includes a suite of mitigation measures intended to minimize potentially adverse interactions with marine mammals and their habitat. We acknowledge that the incidental take authorized by the Authorization would potentially result in insignificant, unavoidable adverse impacts. However, we believe that the issuance of an Authorization would not have any adverse cumulative effects on marine mammal species or their habitats. Any direct

or indirect effects are expected to be temporary and SDOT's overall project is expected to improve the surrounding habitat.

The analysis in this EA, including the documents we incorporate by reference, serve as the basis for determining whether our issuance of an Authorization to SDOT for the taking, by Level B harassment, of small numbers of marine mammals, incidental to conducting the Project in Elliott Bay, Washington, September 2013 to September 2018, would result in significant impacts to the human environment.

CHAPTER 1 – INTRODUCTION AND PURPOSE AND NEED

1.1 DESCRIPTION OF PROPOSED ACTION

The Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1631 *et seq.*) prohibits the incidental taking of marine mammals. For a marine mammal to be incidentally taken, it is either killed, seriously injured, or harassed. The relevant definition of harassment in the MMPA is any act of pursuit, torment, or annoyance which: (1) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (2) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment). There are exceptions to the MMPA's prohibition on take such as the authority at issue here for us to authorize the incidental taking of small numbers of marine mammals by harassment upon the request of a U.S. citizen provided certain statutory and regulatory procedures are met and determinations made. We describe this exception set forth in the MMPA at Section 101(a)(5)(A) in more detail in Section 1.2.

We (National Marine Fisheries Service, Office of Protected Resources, Permits and Conservation Division) propose to issue a rulemaking and subsequent Letters of Authorization (Authorization) to the City of Seattle's Department of Transportation (SDOT) under the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1631 *et seq.*) for the incidental taking of small numbers of marine mammals, incidental to the Elliott Bay Seawall Project (Project) along the shoreline of Seattle, Washington, September 2013 to September 2018. We do not have the authority to authorize or prohibit SDOT's Project in Elliott Bay.

Our proposed action is triggered by SDOT requesting an Authorization to take marine mammals incidental to conducting the proposed activity within Elliott Bay. SDOT's Project has the potential to cause marine mammals to be behaviorally disturbed by exposing them to elevated levels of sound which, as we have explained, is anticipated to result in take that would otherwise be prohibited by the MMPA. SDOT therefore requires an Authorization for incidental take and has requested that we provide it through the issuance of a rulemaking and subsequent Letters of Authorization under section 101(a)(5)(A) of the MMPA. Our issuance of an Authorization to SDOT is a major federal action under the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*), the Council on Environmental Quality (CEQ) regulations in 40 CFR §§ 1500-1508, and NOAA Administrative Order (NAO) 216-6. Thus, we are required to analyze the effects on the human environment and determine whether they are significant such that preparation of an Environmental Impact Statement (EIS) is necessary.

This EA titled, *Issuance of a Rulemaking and Subsequent Letters of Authorization to the City of Seattle's Department of Transportation to Take Marine Mammals by Harassment Incidental to the Elliott Bay Seawall Project in Seattle, Washington, September 2013 to September 2018*, addresses the potential environmental impacts of three choices available under section 101(a)(5)(A) of the MMPA, namely:

- Issue the Authorization to SDOT for Level B harassment take of marine mammals under the MMPA during the Project, taking into account the prescribed means of take, mitigation measures, and monitoring requirements required in the Authorization;
- Not issue an Authorization to SDOT in which case, for the purposes of NEPA analysis only, we assume the activities would proceed and cause incidental take without the mitigation and monitoring measures prescribed in the Authorization; or

- Issue the Authorization to SDOT for Level B harassment take of marine mammals under the MMPA during the Project, with additional mitigation measures required.

1.1.1 BACKGROUND ON THE APPLICANT’S MMPA APPLICATION

SDOT proposes to replace the Elliott Bay Seawall from South Washington Street to Broad Street, along the Seattle waterfront abutting Elliott Bay in King County, Washington. Construction activities would involve in-water vibratory and impact pile installation and removal. The purpose of the Project is to reduce the risks of coastal storm and seismic damage and to protect public safety, critical infrastructure, and associated economic activities in the area. Additionally, the project would improve the degraded ecosystem functions and processes of the Elliott Bay nearshore around the existing seawall. Public amenities resulting from the Project would include replaced railings, restoration of the Washington Street boat landing, riparian planters, street plantings, and reconstructed sidewalks.

1.1.2 MARINE MAMMALS IN THE ACTION AREA

Marine mammals under our jurisdiction that could be adversely affected by the proposed Project include:

Mysticetes

- Humpback whale (*Megaptera novaengliae*)
- Gray whale (*Eschrichtius robustus*)

Odontocetes

- Dall’s porpoise (*Phocoenoides dalli*)
- Harbor porpoise (*Phocoena phocoena*)
- Southern resident killer whale Distinct Population Segment (DPS) (*Orcinus orca*)
- Transient killer whale (*Orcinus orca*)

Pinnipeds

- California sea lion (*Zalophus californianus*)
- Pacific harbor seal (*Phoca vitulina*)
- Steller sea lion (*Eumetopias jubatus*)

1.2 PURPOSE AND NEED

The MMPA and Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq.*) prohibit “takes” of marine mammals and of threatened and endangered species, respectively, with only a few specific exceptions. The applicable exceptions in this case are an exemption for incidental take of marine mammals in sections 101(a)(5)(A) of the MMPA and 7(o)(2) of the ESA.

Section 101(a)(5)(A) of the MMPA directs the Secretary of Commerce (Secretary) to authorize, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock, by United States citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if we make certain findings and provide a notice of a proposed authorization to the public for review. Entities seeking to obtain authorization for the incidental take of marine mammals under our jurisdiction must submit such a request (in the form of an application) to us.

In the case of a federal action that may affect marine mammal species listed as threatened or endangered under the ESA, the action agency responsible for funding, authorizing, or carrying out the action must consult with NMFS under section 7 of the ESA to ensure that its action is not likely to jeopardize a listed species or result in the adverse modification or destruction of any designated critical habitat. The section 7 consultation process for this action is described in section 1.4.1. Consultation is completed when NMFS issues a Biological Opinion (Opinion). The Opinion includes, among other things, an Incidental Take Statement (ITS) which must specify mitigation measures included in an incidental take authorization for listed marine mammal species. Any incidental take that occurs consistent with the terms and conditions in the ITS is not considered prohibited take under the ESA and is thus exempted.

We have promulgated regulations to implement the permit provisions of the MMPA (50 CFR Part 216) and have produced Office of Management and Budget (OMB)-approved application instructions (OMB Number 0648-0151) that prescribe the procedures necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA. Applications for an Authorization must be submitted according to regulations at 50 CFR § 216.104.

1.2.1 PURPOSE OF ACTION

The primary purpose of our proposed action—the issuance of an Authorization to the SDOT—is to determine (pursuant to the MMPA) whether or not to authorize the SDOT’s request for the take of marine mammals incidental to the Project. The Authorization, if issued, would provide an exception to SDOT from the take prohibitions contained in the MMPA and would allow take of marine mammals, incidental to the Project from September 2013 to September 2013. To authorize the take of small numbers of marine mammals in accordance with Section 101(a)(5)(A) of the MMPA, we must evaluate the best available scientific information to determine whether the take would have a negligible impact on marine mammals or stocks and have an unmitigable impact on the availability of affected marine mammal species for certain subsistence uses. We cannot issue an authorization if it would result in more than a negligible impact on marine mammals or stocks or result in an unmitigable impact on subsistence. The statute also establishes substantive requirements. We must set forth the permissible methods of taking and other means of effecting the least practicable impact on the species or stocks of marine mammals and their habitat (i.e. mitigation), paying particular attention to rookeries, mating grounds, and areas of similar significance. If appropriate, we must prescribe means of effecting the least practicable impact on the availability of the species or stocks of marine mammals for subsistence uses. Authorizations must also include requirements or conditions pertaining to the monitoring and reporting of such taking in large part to better understand the effects of such taking on the species. A proposed Authorization must be published in the *Federal Register* for public notice and comment. The purpose of this action is therefore to determine whether the Project would have a negligible impact on marine mammals or stocks and develop mitigation and monitoring measures to reduce the potential impacts of the Project on marine mammals.

1.2.2 NEED FOR ACTION

As noted above this section, the MMPA establishes a general moratorium or prohibition on the take of marine mammals, including take by Level B (behavioral) harassment. The MMPA establishes a process discussed in section 1.2.1 by which individuals engaged in specified

activities within a specified geographic area may request an incidental take authorization for the incidental take of small numbers of marine mammals.

On September 17, 2012, SDOT submitted an application demonstrating both the need and potential eligibility for issuance of a rulemaking and subsequent Letters of Authorization in connection with the Project described in section 1.1.1. We now have a corresponding duty to determine whether and how we can fashion an Authorization authorizing take by Level B harassment incidental to the activities described in SDOT's application. The need for this action is therefore established and framed by the MMPA and our responsibilities under section 101(a)(5)(A) of the MMPA, its implementing regulations, and other applicable requirements which will influence our decision making, such as section 7 of the ESA which is discussed in more detail below this section. In order for an alternative to be considered reasonable it must meet the statutory and regulatory requirements. The previously mentioned purpose and need guide us in developing reasonable alternatives for consideration, including alternative means of mitigating potential adverse effects. We are thus developing and analyzing alternative means of developing and issuing an Authorization, not alternative means of the applicant carrying out the underlying activities described in its application. However, we recognize that mitigation measures developed and included in a final Authorization might affect those activities.

1.3 THE ENVIRONMENTAL REVIEW PROCESS

NEPA compliance is necessary for all "major" federal actions with the potential to significantly affect the quality of the human environment. Major federal actions include activities that are fully or partially funded, regulated, conducted, or approved by a federal agency. Because our issuance of an Authorization would allow for the taking of marine mammals consistent with provisions under the MMPA and incidental to the applicant's activities, we consider this as a major federal action subject to NEPA.

Under the requirements of NAO 216-6, the proposed issuance of authorization for incidental take of marine mammals is an action that is not categorically excluded from NEPA review. Similar actions have not normally been found to have significant effects on the human environment and therefore do not normally require an Environmental Impact Statement (EIS). Therefore, we prepared this EA to determine whether the direct, indirect, and cumulative impacts related to its issuance of the authorization for incidental take of marine mammals under the MMPA during the Project are likely to be significant. If we deem the potential impacts to be not significant, this analysis, in combination with other analyses incorporated by reference—may support the issuance of a Finding of No Significant Impact (FONSI) for the proposed Authorization.

1.3.1 LAWS, REGULATIONS, OR OTHER NEPA ANALYSES INFLUENCING THE EA'S SCOPE

We have based the scope of the proposed action and nature of the two alternatives (*i.e.*, whether or not to issue the Authorization including prescribed means of take, mitigation measures, and monitoring requirements) considered in this EA on the relevant requirements in section 101(a)(5)(A) of the MMPA. The scope of our analysis is thus bounded by our decision making discussed in section 1.3.2. We believe this analysis, when combined with the analysis in Tetra Tech, Inc.'s 2012 Biological Assessment; Tetra Tech, Inc.'s 2012 Fish, Wildlife, and Vegetation Discipline Report; and our proposed rulemaking (78 FR 22096, April 12, 2013) fully evaluate the impacts associated with the Project with mitigation and monitoring for marine mammals.

MMPA APPLICATION AND NOTICE OF THE PROPOSED RULEMAKING

The regulations published by the Council on Environmental Quality (CEQ regulations) 40 CFR §1502.25 encourage federal agencies to integrate NEPA's environmental review process with other environmental review laws. We rely substantially on the public process for developing proposed Authorizations under the MMPA and its implementing regulations to develop and evaluate relevant environmental information and provide a meaningful opportunity for public participation as we develop corresponding EAs. We fully consider public comments received in response to our publication of the proposed rulemaking during the corresponding NEPA review process.

On April 12, 2013, we published a notice of a proposed rulemaking with our preliminary determinations in the *Federal Register* (78 FR 22096). The notice included a detailed description of the revised proposed action resulting from the MMPA consultation process; consideration of environmental issues and impacts of relevance related to the issuance of an Authorization; and potential mitigation and monitoring measures to avoid and minimize potential adverse impacts to marine mammals and their habitat. We requested in that notice that the public submit comments, information, and suggestions concerning the request and the content of the proposed regulations to govern the taking described in the proposed rulemaking.

This EA incorporates by reference and relies on SDOT's 2012 application, our notice of a proposed Authorization (78 FR 22096, April 12, 2013), and Tetra Tech, Inc.'s environmental analyses by reference to avoid duplication of analysis and unnecessary length.

In addition to the information listed previously, our notice of a proposed rule (78 FR 22096, April 12, 2013) provided information on our proposal to issue an Authorization to SDOT to incidentally harass, by Level B harassment only, nine species of marine mammals during the proposed Project. Within the notice of the proposed Authorization (78 FR 22096, April 12, 2013) we considered the applicant's proposed action and their proposed mitigation and related monitoring measures that would constitute the means of effecting the least practicable impact on marine mammals including: (1) limited impact pile driving; (2) containment of impact pile driving; (3) additional attenuation measures; (4) ramp-up of pile driving operations; (5) marine mammal exclusion zones; (6) shutdown and delay procedures; (7) boat-based mitigation monitoring, as necessary; (8) shore-based visual monitoring; and (9) acoustic monitoring to confirm estimated noise levels. We preliminarily determined, provided that SDOT implemented the required mitigation and monitoring measures, that the impact of conducting the Project in Elliott Bay, from September 2013 through September 2018, would result, at worst, in a modification in behavior and/or low-level physiological effects (Level B harassment) of certain species of marine mammals.

ANALYSIS ON THE PROPOSED PROJECT AND ISSUANCE OF AN ASSOCIATED AUTHORIZATION

After conducting an independent review of the information and analyses for sufficiency and adequacy, we incorporate by reference the relevant analyses on SDOT's proposed action as well as a discussion of the affected environment and environmental consequences within the following documents per 40 CFR 1502.21 and NAO 216-6 § 5.09(d):

- SDOT's 2012 *Biological Assessment*, prepared by Tetra Tech, Inc.; and
- SDOT's 2012 *Fish, Wildlife, and Vegetation Discipline Report*, prepared by Tetra Tech, Inc.

In summary, Tetra Tech, Inc.'s analyses conclude that with incorporation of monitoring and mitigation measures proposed by SDOT, the potential impacts of the proposed action to marine mammals would be limited to localized changes in behavior and distribution near the project area and would qualify as Level B harassment under the MMPA. SDOT did not identify any significant environmental issues or impacts.

1.3.2 SCOPE OF ENVIRONMENTAL ANALYSIS

Given the limited scope of the decision for which we are responsible (*i.e.* whether or not to issue the Authorization which includes prescribed means of take, mitigation measures and monitoring requirements) this EA (relying on the environmental review and analyses performed by Tetra Tech, Inc., SDOT's application, and the notice of proposed Authorization collectively incorporated by reference herein) is intended to provide more focused information on the primary issues and impacts of environmental concern related specifically to our issuance of the rulemaking and subsequent LOAs authorizing the take of marine mammals incidental to SDOT's activities and mitigation measures to minimize the effects of that take. For these reasons, this EA does not further evaluate effects to elements of the human environment not affected by our issuance of an Authorization (*e.g.* air quality, historic and cultural resources, etc.).

1.3.3 NEPA PUBLIC INVOLVEMENT SUMMARY

NAO 216-6 established agency procedures for complying with NEPA and the implementing NEPA regulations issued by the CEQ. Consistent with the intent of NEPA and the clear direction in NAO 216-6 to involve the public in NEPA decision-making, we requested comments on the potential environmental impacts described in the MMPA application and in the *Federal Register* notice of the proposed rule (78 FR 22096, April 12, 2013). The CEQ regulations further encourage agencies to integrate the NEPA review process with review under the environmental statutes. Consistent with agency practice we integrated our NEPA review and preparation of this EA with the public process required by the MMPA for issuance of rule.

The *Federal Register* notice of the proposed rule with our preliminary determinations (78 FR 22096, April 12, 2013), supporting analyses, and corresponding public comment period are instrumental in providing the public with information on relevant environmental issues and offering the public a meaningful opportunity to provide comments to us for consideration in both the MMPA and NEPA decision-making processes.

The *Federal Register* notice of the proposed rule (78 FR 22096, April 12, 2013) summarized our purpose and need; included a statement that we would prepare an EA for the proposed action; and invited interested parties to submit written comments concerning the application and our preliminary analyses. The notice of the proposed rule was available for public review and comment from April 12, 2013 to May 13, 2013.

This process served the public participation function for this EA in terms of providing the public a meaningful opportunity to participate in the environmental decision-making process. In addition, we posted SDOT's application on our website at:

<http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications> concurrently with the release of our *Federal Register* notice requesting comments on the proposed Authorization (78 FR 22096, April 12, 2013). This EA does not expand the scope of environmental issues and impacts for consideration and is based primarily on the information included in our *Federal Register*

notice (78 FR 22096, April 12, 2013), the documents it references, and the public comments provided in response. Therefore, we did not release a draft of this EA for additional review based on our determination that its release would neither yield additional information to inform our decision making, nor provide for more meaningful public involvement. At the conclusion of this process, we will post the final EA, and, if appropriate, FONSI, on the same website.

1.3.4 RELEVANT COMMENTS ON OUR *FEDERAL REGISTER* NOTICE

During the 30-day public comment period on the notice of the proposed Authorization (78 FR 22096, April 12, 2013) we only received comments from the Marine Mammal Commission (Commission). The Commission provides comments on all proposed Incidental Take Authorizations as part of their established role under the MMPA (§ 202 (a)(2), “*humane means of taking marine mammals*”).

We briefly summarize the Commission’s comments here. Generally, the Commission recommended that we:

- Further justify our conclusion that the Level B harassment of 19 percent of the southern resident killer whale population each year qualifies as “small numbers.”
- Work with the Commission and the U.S. Fish and Wildlife Service to develop a policy for determining what constitutes small numbers and negligible impact.
- Require SDOT to implement ramp-up procedures following the delay or shutdown of pile driving operations due to the presence of a marine mammal.
- Require SDOT to monitor for marine mammals for 30 minutes after pile driving and removal operations have ended.

We have considered the comments regarding monitoring and mitigation measures within the context of the MMPA requirement to prescribe means of effecting the least practicable impact to marine mammals and their habitats. We have developed responses to specific comments related to the incidental harassment of marine mammals and will provide those responses in the *Federal Register* notice announcing the issuance of the Authorization. We fully considered the Commission’s comments in preparing the final Authorization and this EA.

Based on those comments, we have re-evaluated the mitigation and monitoring proposed for incorporation in the Authorization and have determined, based on the best available data that the mitigation measures proposed by the applicant, in addition to ramp-up procedures and post-activity monitoring, are the most feasible and effective monitoring and mitigation measures to achieve the MMPA requirement of effecting the least practicable impact on each marine mammal species or stock. Public comments, therefore, revealed additional feasible means of effective mitigation for the proposed action.

1.4 OTHER PERMITS, LICENSES, OR CONSULTATION REQUIREMENTS

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action.

1.4.1 U.S. ENDANGERED SPECIES ACT OF 1973

Section 7 of the ESA requires consultation for actions funded, authorized or carried out by federal agencies (i.e. federal actions) that may affect a species listed as threatened or endangered

or that may affect designated critical habitat under the ESA. The regulations at 50 CFR § 402 specify the requirements for these consultations with the National Marine Fisheries Service.

SDOT has requested authorization for the incidental take of the following marine mammals that are listed as endangered under the ESA under our jurisdiction: the Eastern North Pacific southern resident stock of killer whales, humpback whales, and Steller sea lions (proposed for delisting). Under section 7 of the ESA, the ACOE, the lead federal agency which permits the Project, has conducted a formal consultation with the National Marine Fisheries Service, Northwest Regional Office, on this proposed Project.

Likewise, our issuance of an Authorization is an interrelated federal action that is also subject to the requirements of section 7 of the ESA. As a result, we are required to ensure that the action of our issuance of an Authorization to SDOT is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. In order for us to authorize the incidental take of southern resident killer whales, humpback whales, and Steller sea lions, we have also conducted a concurrent formal consultation with the National Marine Fisheries Service's Northwest Regional Office.

The formal consultation under section 7 of the ESA will conclude with a single Biological Opinion for the ACOE and to the National Marine Fisheries Service's Office of Protected Resources, Permits and Conservation Division for the Project and associated Authorization.

CHAPTER 2 – ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

The NEPA and the implementing CEQ regulations (40 CFR §§ 1500-1508) require consideration of alternatives to proposed major federal actions and NAO 216-6 provides agency policy and guidance on the consideration of alternatives to our proposed action. An EA must consider all reasonable alternatives, including Alternative 1 (the preferred action alternative). It must also consider the no action alternative, even if it does not meet the stated purpose and need, so as to provide a baseline analysis against we can compare the action alternative.

To warrant detailed evaluation as a reasonable alternative, an alternative must meet our purpose and need. In this case, as we previously explained, an alternative will only meet the purpose and need if it satisfies the requirements under section 101(a)(5)(D) the MMPA (see Chapter 1)—which serves as the only screening criteria. We evaluated each potential alternative against these criteria. Based on this evaluation we have identified two action alternatives, along with the No Action alternative, and carried these forward for evaluation in this EA.¹

Alternatives 1 and 2 include a suite of mitigation measures intended to minimize potentially adverse interactions with marine mammals. This chapter describes both alternatives and compares them in terms of their environmental impacts and their achievement of objectives.

As described in Section 1.2.1, we must prescribe the means of effecting the least practicable adverse impact on the species or stocks of marine mammals and their habitat. In order to do so, we must consider SDOT's proposed mitigation measures, as well as other potential measures, and assess the benefit of the considered measures to the potentially affected species or stocks and their habitat. Our evaluation of potential measures includes consideration of the following factors in relation to one another: (1) the manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals; (2) the proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and (3) the practicability of the measure for applicant implementation.

Any additional mitigation measure proposed by us beyond what the applicant proposes should be able to or have a reasonable likelihood of accomplishing or contributing to the accomplishment of one or more of the following goals:

- Avoidance or minimization of marine mammal injury, serious injury, or death wherever possible;
- A reduction in the numbers of marine mammals taken (total number or number at biologically important time or location);
- A reduction in the number of times individual marine mammals are taken (total number or number at biologically important time or location);

¹ For instances involving federal decisions on proposals for projects, the single action alternative would consider the effects of permitting the proposed activity which would be compared to "No action" alternative. In this case, the proposed activity would not take place, and the resulting environmental effects from taking no action would be compared with the effects of permitting the proposed activity to proceed (NEPA; Section 1502.14(d)). NEPA Sec. 1508.23 states that an agency subject to the Act has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated.

- A reduction in the intensity of the anticipated takes (either total number or number at biologically important time or location);
- Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base; activities that block or limit passage to or from biologically important areas; permanent destruction of habitat; or temporary destruction/disturbance of habitat during a biologically important time; and
- For monitoring directly related to mitigation, an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

2.2 DESCRIPTION OF SDOT'S PROPOSED PROJECT

SDOT plans to replace the Elliott Bay Seawall in Seattle, Washington. The Project would reduce the risks of coastal storm and seismic damages and protect public safety, critical infrastructure, and associated economic activities along Seattle's central waterfront. Construction would require the use of vibratory and impact pile driving and removal.

SDOT's proposed construction activities would commence in September 2013 and are expected to occur in two phases. Construction would take place throughout the year, with summer shutdown periods from Memorial Day weekend through Labor Day weekend to accommodate the primary tourist and business season. SDOT's application request covers the construction period from 2013 to 2018, from the start of Phase 1 to the end of Phase 2, Segment 2 (see the proposed rule for details; 78 FR 22096, April 12, 2013).

The Elliott Bay Seawall runs along the downtown Seattle waterfront in King County, Washington. SDOT's proposed project would occur between South Washington Street and Broad Street, which abut Elliott Bay, a 21-square kilometer urban embayment in central Puget Sound.

2.2.2 PILE DRIVING OPERATIONS

SDOT's application and our notice of the proposed Authorization (78 FR 22096, April 12, 2013) describe pile driving operations in detail. We incorporate those descriptions by reference in this EA and briefly summarize them here.

A vibratory hammer would be used for the majority of pile installation and removal; however, an impact hammer may be used to set piles. A total of 1,930 piles would be installed over a 5-year period, and 1,740 of those piles would also be removed (leaving 190 permanent piles). In addition, 80 existing piles would be removed over a 5-year period. Roughly the same number and distribution of in-water steel sheet piles and permanent piles is expected for each year of the project. Prior to excavation and demolition of the existing seawall, a temporary containment wall constructed of steel sheet piles would be installed in each construction segment. The temporary containment wall would serve to prevent adverse effects on nearshore marine habitat.

The highest sound pressure would result from impact pile installation (190 dB RMS). Average sound pressures during all vibratory and impact pile installation and removal are expected to exceed our acoustic threshold criteria. Relative water depth during pile driving operations is expected to be about 15 m.

2.3 DESCRIPTION OF ALTERNATIVES

2.3.1 ALTERNATIVE 1 – ISSUANCE OF AN AUTHORIZATION WITH MITIGATION MEASURES

The Proposed Action constitutes Alternative 1 and is the Preferred Alternative. Under this alternative, we would issue a 5-year rulemaking and subsequent Letters of Authorization to SDOT allowing the incidental take, by Level B harassment, of nine species of marine mammals during construction subject to the mandatory mitigation and monitoring measures and reporting requirements set forth in the final Authorization, if issued.

SDOT's analyses and our *Federal Register* notice requesting comments on the proposed Authorization (78 FR 22096, April 12, 2013) analyzed the potential impacts of this alternative in detail. We incorporate those analyses by reference in this EA and briefly summarize the mitigation and monitoring measures and reporting requirements likely to be incorporated in the final Authorization, if issued, in the following sections.

We preliminarily determined, under section 101(a)(5)(A) of the MMPA that the measures included in the proposed Authorization were sufficient to reduce the effects of SDOT's activity on marine mammals to the level of least practicable adverse impact. In addition, we preliminarily determined that the taking of small numbers of marine mammals incidental to SDOT's action would constitute no more than a negligible impact on the relevant species or stocks (78 FR 22096, April 12, 2013).

In addition, we have added ramp-up procedures and post-activity monitoring to the requirements to be included in the final Authorization, per the Marine Mammal Commission's recommendation. Otherwise, we have not altered the mitigation, monitoring, and reporting requirements to be included in the final Authorization; nor have we received any information that would cause us to change our negligible impact or small numbers determinations. Accordingly, this Preferred Alternative would satisfy the purpose and need of our proposed action under the MMPA—issuance of an Authorization, along with required mitigation measures and monitoring, and would enable us and SDOT to comply with the statutory and regulatory requirements of the MMPA and ESA.

MITIGATION AND MONITORING MEASURES

To reduce the potential for disturbance from acoustic stimuli associated with the activities, SDOT has agreed to implement the following mitigation and monitoring measures for marine mammals:

- 1) limited impact pile driving;
- 2) containment of impact pile driving;
- 3) additional attenuation measures, as necessary;
- 4) ramp-up procedures;
- 5) marine mammal exclusion zones; shutdown and delay procedures;
- 6) boat-based mitigation monitoring, as necessary;
- 7) shore-based visual monitoring; and
- 8) acoustic monitoring to confirm estimated noise levels.

If we issue the Authorization to SDOT, we would include these as mandatory requirements to achieve the MMPA requirement of effecting the least practicable impact on each species or stock of marine mammals.

Limited Impact Pile Driving: All sheet piles would be installed using a vibratory driver, unless impact driving is required to install piles that encounter consolidated sediments or for proofing load bearing sections. The use of vibratory pile driving reduces pile driving noise to levels less than the injury threshold for marine mammals. Any impact driving used in conjunction with vibratory pile driving would employ attenuation measures such as a cushioning block, where applicable. Any attenuation measures that become available for vibratory pile driving would also be considered.

Containment of Impact Pile Driving: The majority of permanent concrete piles would be driven behind the temporary containment wall that would function as a physical barrier to partially attenuate pile driving noise. Estimated noise-reduction values are not readily available for this attenuation type; however, it has been shown that the use of cofferdams, which are analogous to the temporary containment wall, is effective at reducing noise up to 10 dB (Caltrans, 2009).

Additional Attenuation Measures: Other attenuation measures such as bubble curtains may be employed as necessary to reduce sound levels. While bubble curtains were considered, they are not being proposed due to the potential for resuspension of contaminated materials and/or existing sediment caps; however, in some locations they could be feasible for the concrete pile driving and would be considered if sound levels are measured higher than what is shown in this analysis. In the event that underwater sound monitoring shows that noise generation from pile installation exceeds the levels originally expected, the implementation of additional attenuation devices would be reevaluated and discussed with us.

Ramp-Up Procedures: The objective of a ramp-up is to alert any animals close to the activity and allow them time to move away, which would expose fewer animals to loud sounds, including both underwater and above water sound. This procedure also ensures that any animals missed during monitoring within the exclusion zone would have the opportunity to move away from the activity and avoid injury. During all in-water pile-related activities, ramp-up would be used at the beginning of each day's in-water pile-related activities or if pile driving has ceased for more than 1 hour.

Marine Mammal Exclusion Zones: SDOT would establish different exclusion zones for different types of in-water pile-related activities:

- 1) An exclusion zone for pinnipeds and small cetaceans with a radius of 61 m (200 ft) waterward of each steel sheet pile source during impact pile driving;
- 2) An exclusion zone for pinnipeds and small cetaceans with a radius of 15 m (50 ft) waterward of each concrete piling point source during impact pile driving;
- 3) An exclusion zone for large whales with a radius of 1,000 m (3,280 ft) waterward of each steel sheet or concrete pile driving during impact pile driving; and
- 4) An exclusion zone for large whales with a radius of 3,981 m (2.5 miles) waterward of each steel sheet pile source during vibratory pile driving.

These zones are intended to provide a physical threshold for a stop-work order for in-water pile-related activities if a marine mammal nears the proposed work area. At the start of in-water pile-related construction each day, a minimum of one qualified protected species observer would be staged on land (or an adjacent pier) near the location of in-water activities to document any marine mammal that approaches the exclusion zones. Additional land-based observers would be deployed if needed to ensure the construction area is adequately monitored. Land-based monitoring would occur throughout each day of active pile-related activities.

Shutdown and Delay Procedures: If a marine mammal is seen approaching or entering an exclusion zone, observers would immediately notify the construction personnel operating the pile-related equipment to shutdown pile-related activities. If a marine mammal(s) is present within the applicable exclusion zone prior to in-water pile-related activities, pile driving/removal would be delayed until the animal(s) has left the exclusion zone or until 15 minutes have elapsed without observing the animal.

Visual Monitoring: In addition to mitigation monitoring, a minimum of two protected species observers would be positioned on land at the north and south ends of Elliott Bay near the 2.5 mile exclusion zone to monitor for marine mammals during vibratory pile-related activities or any other construction activities that may pose a threat to marine mammals moving through the area. Observers would be responsible for recording the location of all marine mammal sightings and logging information onto marine mammal sighting forms.

Acoustic Monitoring: SDOT would conduct acoustic monitoring during pile-related in-water work. The purpose of this monitoring would be to identify or confirm noise levels for pile-related work during in-water construction. Collection of acoustic data would be accomplished from both a drifting boat to reduce the effect of flow noise, and attached on or adjacent to piers located 10 m from the pile source. All acoustical recordings would be conducted 1 m below the water surface and 1 m above the sea floor. Background noise recordings (in the absence of pile driving) would also be made to provide a baseline background noise profile. The results and conclusions of the study would be summarized and presented to us with recommendations for any modifications to the monitoring plan or exclusion zones.

REPORTING MEASURES

SDOT would submit annual reports to us summarizing information and data collected for each marine mammal species observed in the project area. In addition, SDOT would submit a draft comprehensive final report to us 180 days prior to the expiration of the regulations. This comprehensive report would provide full documentation of the methods, results, and interpretation of all monitoring during the first 4.5 years of the regulations. A revised final comprehensive report, including all monitoring results during the entire period of the regulations, would be due 90 days after the regulations expire.

2.3.2 NO ACTION ALTERNATIVE

We are required to evaluate the No Action Alternative per CEQ NEPA regulations. The No Action Alternative serves as a baseline to compare and contrast the potential impacts of the preferred and other alternatives.

Under the No Action Alternative, we would not issue an Authorization to SDOT for the taking, by Level B harassment, of small numbers of marine mammals, incidental to the Project. SDOT

would not receive an exemption from the MMPA and ESA prohibitions against the take of marine mammals. Under this alternative, SDOT could:

- Choose not to proceed with conducting the specified activities; or
- Proceed with their specified activities without complying with the MMPA and ESA prohibitions against the take of marine mammals. Pile driving activities would proceed without the protective measures and reporting requirements required by a final Authorization under the MMPA and by the Biological Opinion's Incidental Take Statement under the ESA.

For purposes of this EA, we are characterizing the No Action Alternative as conducting pile driving activities as described without the protective measures required by a final Authorization which would also be incorporated into the Biological Opinion's Incidental Take Statement. We have taken this approach as it will allow us to meaningfully evaluate the primary environmental issue – the impact on species from pile driving activities in the absence of protective measures.

2.3.4 ALTERNATIVE 2

We also considered an alternative whereby we issue the Authorization as described in Alternative 1, but with additional mitigation measures. Based on NMFS' analysis and comments received during the proposed rule public comment period, we considered the addition of the following mitigation measures to Alternative 1:

- The implementation of ramp-up procedures after 15 minutes following delay or shutdown because of pinniped presence; and
- Larger exclusion zones to prevent the Level B harassment of large whales.

All other aspects of the specified activity and NMFS' mitigation, monitoring, and reporting requirements would remain the same as Alternative 1.

CHAPTER 3 – AFFECTED ENVIRONMENT

This chapter describes existing conditions in the project area. Complete descriptions of the physical, biological, and social environment of the action area are in Tetra Tech's 2012 Biological Assessment and 2012 Fish, Wildlife, and Vegetation Discipline Report. We incorporate those descriptions by reference and briefly summarize or supplement the relevant sections for marine mammals in the following subchapters.

3.1 PHYSICAL ENVIRONMENT

We are required to consider impacts to the physical environment under NOAA NAO 216-6. As discussed in Chapter 1, our proposed action and alternatives relate only to the authorization of incidental take of marine mammals and not to the physical environment. Certain aspects of the physical environment are not relevant to our proposed action (see subchapter 1.3.2 - Scope of Environmental Analysis). Because of the requirements of NAO 261-6, we briefly summarize the physical components of the environment here.

3.1.1 MARINE MAMMAL HABITAT

We presented information on marine mammal habitat and the potential impacts to marine mammal habitat in the proposed rule *Federal Register* notice (78 FR 22096, April 12, 2013). In summary, marine mammals transit through Elliott Bay and may opportunistically feed in areas surrounding the proposed Project. The Project area overlaps somewhat with southern resident killer whale critical habitat (designated throughout the Puget Sound region).

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 MARINE MAMMALS

We provide information on the occurrence, distribution, population size, and conservation status for each of the species of marine mammal, including nine marine mammal species under our jurisdiction that may occur in the proposed project area.

We presented this information earlier in Section 1.1.2 in this EA and in Table 7 in the *Federal Register* notice requesting comments on the proposed Authorization (78 FR 22096, April 12, 2013) and we incorporate those descriptions by reference here. Our agency's Stock Assessment Reports (Waring, Josephson, Fairfield-Walsh, Maze-Foley, & Rosel, 2013; <http://www.nmfs.noaa.gov/pr/sars/species.htm>) provide the latest abundance and life history information about each stock.

All of the marine mammals are protected under the MMPA and three of these species are listed as endangered under the ESA and thus depleted under the MMPA, including the southern resident killer whale, humpback whale, and Steller sea lion.

CHAPTER 4 – ENVIRONMENTAL CONSEQUENCES

This chapter of the EA analyzes the impacts of the two alternatives (*i.e.*, whether or not to issue the Authorization which includes prescribed means of incidental take, mitigation measures, and monitoring requirements for marine mammals only) and addresses the potential direct, indirect, and cumulative impacts of our issuance of an Authorization for Level B harassment take of marine mammals during the Project. SDOT's analyses (*i.e.*, the 2012 Biological Assessment and their 2012 Fish, Wildlife, and Vegetation Discipline Report) and our *Federal Register* notice requesting comments on the proposed Authorization (78 FR 22096, April 12, 2013) facilitate an analysis of the direct, indirect, and cumulative effects of our proposed issuance of an Authorization.

Under the MMPA, we have evaluated the potential impacts of SDOT's action in order to determine whether to authorize incidental take of marine mammals. Under NEPA, we have determined that an EA is appropriate to evaluate the potential significance of environmental impacts to the marine environment resulting from the Project that would occur after issuance of this Authorization.

4.1 EFFECTS OF ALTERNATIVE 1 – ISSUANCE OF AN AUTHORIZATION WITH MITIGATION

Alternative 1 is the Preferred Alternative under which we would issue rulemaking and subsequent Letters of Authorization to SDOT for the taking, by Level B harassment, of small numbers of marine mammals, incidental to the Elliott Bay Seawall Project. We would incorporate the mitigation and monitoring measures and reporting described earlier in this EA into a final Authorization.

SDOT's 2012 Biological Assessment, 2012 Fish, Wildlife, and Vegetation Discipline Report, and our *Federal Register* notice requesting comments on the proposed Authorization (78 FR 22096, April 12, 2013) describe, the potential effects of pile driving operations on marine mammals. We incorporate those descriptions by reference and briefly summarize or supplement the relevant sections in the following subchapters.

4.1.1 IMPACTS TO MARINE MAMMAL HABITAT

Our proposed action would have no additive or incremental effect on the physical environment beyond those resulting from construction itself and evaluated in the referenced documents.

The effects of pile driving operations during the Project would not result in substantial or permanent damage to ocean and coastal habitats that might constitute marine mammal habitats. Temporary disturbances are expected; primarily through elevated levels of underwater sound, reduced water quality, and physical habitat alteration associated with the structural footprint of the new seawall. However, overall, the Project is expected to improve marine mammal habitat. The issuance of an Authorization would not affect physical habitat features, such as substrates and water quality.

4.1.2 IMPACTS TO MARINE MAMMALS

The impacts of the Project on marine mammals are specifically related to acoustic activities. We expect that unavoidable impacts to each species of marine mammal that could be encountered within the project area would be limited to temporary behavioral responses (such as brief masking of natural sounds) and temporary changes in animal distribution. At most, we interpret these effects on marine mammals as falling within the MMPA definition of Level B (behavioral) harassment for those species managed by us. We expect these impacts to be minor because we do not anticipate measurable population changes and the duration and extent of the impacts would be short-term and localized.

Under Alternative 1 – Preferred Alternative, we would authorize, the incidental, Level B harassment only, in the form of temporary behavioral disturbance, of several species of cetaceans and pinnipeds and expect no long-term or substantial adverse effects on marine mammals, their habitats, or their role in the environment.

SDOT proposed a number of mitigation and monitoring measures for marine mammals as part of our evaluation for the preferred alternative. In analyzing the effects of the preferred alternative, we conclude that the Authorization’s requirement of the following mitigation and monitoring measures would minimize and/or avoid impacts to marine mammals:

1. limited impact pile driving;
2. containment of impact pile driving;
3. additional attenuation measures, as necessary;
4. ramp-up procedures;
5. marine mammal exclusion zones; shutdown and delay procedures;
6. boat-based mitigation monitoring, as necessary;
7. shore-based visual monitoring; and
8. acoustic monitoring to confirm estimated noise levels.

In SDOT’s application, they did not request authorization to take marine mammals by Level A harassment because their environmental analyses estimate that marine mammals would not be exposed to levels of sound likely to result in Level A harassment (we refer the reader to SDOT’s application and 2012 Biological Assessment). Consequently, SDOT’s request for take by Level A harassment is zero animals for any species.

We do not anticipate that take by injury (Level A harassment), serious injury, or mortalities would occur and expect that harassment takes will be at the lowest level practicable due to the incorporation of the mitigation measures proposed in SDOT’s application, nor would we authorize take by injury, serious injury, or mortality.

Acoustic Thresholds: We have determined that for acoustic effects, using acoustic thresholds in combination with exclusion zones are an effective way to consistently apply measures to avoid or minimize the impacts of an action. SDOT uses the thresholds to establish a mitigation power-down, shut-down or exclusion zone for potential acoustic injury and behavioral disturbance (*i.e.*, if an animal is about to enter or enters an area calculated to be ensonified above the level of an established threshold a sound source is powered-down or shut-down).

Estimated Take of Marine Mammals by Level B Incidental Harassment: SDOT has requested take by Level B harassment as a result of their proposed Project. Acoustic stimuli (*i.e.*, increased underwater sound) generated during pile driving operations are expected to result in the behavioral disturbance of marine mammals.

As mentioned previously, we estimate that nine species of marine mammals under our jurisdiction could be potentially affected by Level B harassment over the course of the proposed authorization. For each species, these take numbers are small (less than three percent for most species, and 4.8, 19, and 6.9 percent for harbor seals, southern resident killer whales, and transient killer whales, respectively) relative to the regional or overall population size. While the Authorization would be valid for 5 years, pile driving operations would be done in phases. A maximum of 101 days of pile driving installation and removal (maximum 12 hours per day) is

expected during the first 3 years of the Authorization and 68 days of pile driving installation and removal during the last 2 years of the Authorization. No pile driving operations would be conducted for the Project between Memorial Day weekend and Labor Day weekend.

Table 3 outlines the number of Level B harassment takes that NMFS proposed for authorization in the proposed rule (78 FR 22096, April 12, 2013), and the regional population estimates for the marine mammal species that may be taken by Level B harassment. Because there are no density estimates for marine mammal populations in Puget Sound, the take numbers were estimated using anecdotal reports, incidental observations, and data from previous incidental take authorizations around Puget Sound. The numbers in Table 3 differ from SDOT's original request because NMFS determined that SDOT's estimated take numbers were unreasonably overestimated. The Estimated Take by Incidental Harassment section of the proposed rule explains this difference in more detail.

Table 3. Estimated marine mammal takes for proposed authorization.

Species	Regional Population ¹	Estimated Number of Takes Per Year	Percentage of Stock that may be Taken
Harbor seal	14,612	700	4.8
California sea lion	296,750	175	<0.1
Steller sea lion	65,000	175	0.3
Harbor porpoise	10,682	315	2.9
Dall's porpoise	42,000	70	0.2
Killer whale (Southern resident)	84	16	19
Killer whale (transient)	346	24	6.9
Gray whale	18,000	8	<0.1
Humpback whale	2,043	4	0.2

¹NMFS' Stock Assessment Reports: www.nmfs.noaa.gov/pr/sars/species.htm

As supported by SDOT's application and supplemental documents and our proposed rule (78 FR 22096, April 12, 2013), we do not expect the activity to impact rates of recruitment or survival for any affected species or stock.

4.2 EFFECTS OF THE NO ACTION ALTERNATIVE

Under the No Action Alternative, we would not issue an Authorization to SDOT for the taking, by Level B harassment, of small numbers of marine mammals, incidental to the proposed Project in Elliott Bay, September 2013 through September 2018. As a result, SDOT would not receive an exemption from the MMPA and ESA prohibitions against take.

The impacts to elements of the human environment resulting from the No Action alternative – conducting the Project in the absence of species protective measures required by the Authorization

under the MMPA and the Incidental Take Statement under the ESA – would be greater than those resulting from Alternative 1.

4.2.1 IMPACTS TO MARINE MAMMAL HABITAT

Under the No Action alternative, the Project would result in similar effects on the physical environment as Alternative 1. Disturbances are expected to be temporary, resulting primarily from elevated levels of underwater sound, reduced water quality, and physical habitat alteration associated with the structural footprint of the new seawall. Overall, the Project is expected to improve marine mammal habitat. The only likely difference in impacts to marine mammal habitat under the No Action alternative would be an increased exposure of elevated levels of underwater sound to marine mammals since there would be no shutdown or delay of pile driving activities.

4.2.2 IMPACTS TO MARINE MAMMALS

Under the No Action alternative, the Project would likely result in increased amounts of Level B harassment to marine mammals and possibly takes by Level A harassment—specifically related to acoustic activities—compared to Alternative 1, due to the absence of mitigation and monitoring measures required under the Authorization.

If the survey proceeded without the protective measures and reporting requirements required by a final Authorization under the MMPA and ESA, the direct, indirect, or cumulative effects on the human or natural environment of not issuing the Authorization would include the following:

- Marine mammals encountered within the project area could experience acoustic injury, temporary behavioral responses (such as brief masking of natural sounds), and temporary changes in animal distribution because of the lack of mitigation measures required in the Authorization and Incidental Take Statement;
- Incidental take of marine mammals may occur at higher levels than we have already identified and evaluated in our *Federal Register* notice on the proposed Authorization (78 FR 22096, April 12, 2013) (i.e., moderate effects vs. minor effects); and
- We would not be able to obtain the monitoring and reporting data needed to assess the anticipated impact of the activity upon the species or stock; and increased knowledge of the species as required under the MMPA.

4.3 EFFECTS OF ALTERNATIVE 2

Under Alternative 2 we would authorize, the incidental, Level B harassment only, in the form of temporary behavioral disturbance, of several species of cetaceans and pinnipeds and expect no long-term or substantial adverse effects on marine mammals, their habitats, or their role in the environment. The potential environmental impacts of this alternative would be similar to the impacts of Alternative 1. We would still expect incidental take of marine mammals by Level B harassment due to elevated in-water sound levels caused by pile driving activities.

4.3.1 IMPACTS TO MARINE MAMMAL HABITAT

Our action under Alternative 2 would have the same impact to marine mammal habitat as Alternative 1.

The effects of pile driving operations during the Project would not result in substantial or permanent damage to ocean and coastal habitats that might constitute marine mammal habitats.

Temporary disturbances are expected; primarily through elevated levels of underwater sound, reduced water quality, and physical habitat alteration associated with the structural footprint of the new seawall. However, overall, the Project is expected to improve marine mammal habitat. The issuance of an Authorization would not affect physical habitat features, such as substrates and water quality.

4.3.2 IMPACTS TO MARINE MAMMALS

Impacts to marine mammals under Alternative 2 would be similar to the impacts under Alternative 1. Implementation of ramp-up procedures after 15 minutes following delay or shutdown because of pinniped presence may allow pinnipeds to vacate the surrounding area before the pile hammer reaches full power – which may result in fewer Level B harassments of pinnipeds or Level B harassment at a lower received level. Expanding the exclusion zones out to the Level B harassment isopleth for large whales would potentially prevent Level B harassment of any large whales during pile driving activities. Level B harassment of other marine mammal species could still occur.

However, these additional mitigation measures failed to meet the statutory and regulatory requirements of the MMPA for an Authorization as they were determined to be impracticable for the applicant or did not provide additional protection to marine mammals. The implementation of ramp-up procedures after 15 minutes following delay or shutdown because of pinniped presence would be impracticable for SDOT because of known pinniped behavior in the area. Pinnipeds have become habituated to anthropogenic activities around Elliott Bay and have been observed to remain in the area regardless of construction. Further delays for SDOT would increase costs and the overall length of the Project. Similarly, larger exclusion zones would further delay SDOT's construction timeline and possibly increase the overall length of the Project. While these additional mitigation measures may provide some added protection for marine mammals, we do not believe they would reduce the overall level of effects.

4.4 COMPLIANCE WITH NECESSARY LAWS – NECESSARY FEDERAL PERMITS

We have determined that the issuance of an Authorization is consistent with the applicable requirements of the MMPA, ESA, and our regulations.

Under section 7 of the ESA, the Army Corps of Engineers initiated formal consultation with the NMFS, Office of Protected Resources, Endangered Species Act Interagency Cooperation Division, on the Project. Likewise, we have also conducted a concurrent formal consultation with the Office of Protected Resources, Endangered Species Act Interagency Cooperation Division.

The formal consultation under section 7 of the ESA concluded with a single Biological Opinion for the Army Corps of Engineers and to the National Marine Fisheries Service's Office of Protected Resources, Permits and Conservation Division. All parties must comply with the relevant terms and conditions of the Incidental Take Statement corresponding to the Biological Opinion issued to Army Corps of Engineers, SDOT, and to us. SDOT must comply with the mitigation and monitoring requirements included in the Authorization in order to be exempted from prohibition on take of listed endangered marine mammal species otherwise prohibited by section 9 of the ESA.

4.4 UNAVOIDABLE ADVERSE IMPACTS

SDOT's 2012 Biological Assessment and 2012 Fish, Wildlife, and Vegetation Report, and our *Federal Register* notice requesting comments on the proposed Authorization (78 FR 22096, April

12, 2013) summarize unavoidable adverse impacts to marine mammals or the populations to which they belong or on their habitats occurring in the survey area. We incorporate those documents by reference.

We acknowledge that the incidental take authorized by the Authorization would potentially result in unavoidable adverse impacts. However, we do not expect SDOT's activities to have adverse consequences on the viability of marine mammals in the project area and we do not expect the marine mammal populations in that area to experience reductions in reproduction, numbers, or distribution that might appreciably reduce their likelihood of surviving and recovering in the wild. Numbers of individuals of all species taken by harassment are expected to be small (relative to species or stock abundance), and the Project would have a negligible impact on the affected species or stocks of marine mammals.

4.5 CUMULATIVE EFFECTS

Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7). Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

Impacts to marine mammal populations include the following: commercial whaling; altered prey base and habitat quality as a result of global warming; ship strikes; fishing gear entanglement; exposure to biotoxins and the resulting bioburden; vessel noise; competition with commercial fisheries; and killer whale predation. These activities account for cumulative impacts to regional and worldwide populations of marine mammals, many of whom are a small fraction of their former abundance and are listed as endangered or threatened under the ESA and depleted under the MMPA.

Marine mammal experts now consider acoustic masking from anthropogenic noise as the major threat to marine mammal populations, particularly low-frequency specialists such as baleen whales. Low-frequency ocean noise has increased in recent decades, often in habitats with seasonally resident populations of marine mammals, raising concerns that noise chronically influences life histories of individuals and populations (Clark et al., 2009). However, quantifying the biological costs for marine mammals within an ecological framework is a critical missing link to our assessment of cumulative noise impacts in the marine environment and assessing cumulative effects on marine mammals (Clark, et al., 2009).

Despite these regional and global anthropogenic and natural pressures, available trend information indicates that most local populations of marine mammals in the Atlantic Ocean are stable or increasing (Waring, et al., 2013). The proposed Project would add another, albeit temporary activity to the marine environment in Elliott Bay (an already industrialized area) and the proposed survey would be limited to a small area of the Puget Sound region for a relatively short period of time.

SDOT's 2012 Biological Assessment and 2012 Fish, Wildlife, and Vegetation Report summarizes the potential cumulative effects to marine mammals or the populations to which they belong or on their habitats occurring in the project area. Our analyses which incorporate their analyses by reference and briefly summarize them here focuses on activities that could impact animals specifically in the proposed project area (*i.e.*, construction activities, vessel traffic, and commercial fisheries).

4.5.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE CONSTRUCTION ACTIVITIES AND EFFECTS IN ELLIOTT BAY

The proposed Project is one of several projects that may occur along the downtown Seattle waterfront area. Other projects that may occur around the Elliott Bay Seawall Project include: Waterfront Seattle Program; Elliott/Western Connector; Mercer West Project; First Avenue Streetcar; and City of Seattle combined sewer overflows control. Other construction and development activities have been and may be conducted in this region in the future. As described in Tetra Tech's environmental analysis documents referenced earlier in this EA and incorporated by reference, cumulative effects from all of these actions are expected to result in a reduction in contaminants entering Elliott Bay. Cumulative benefits are anticipated for the Elliott Bay ecosystem and its resources.

There are no other construction activities with an Authorization from us scheduled to occur Elliott Bay from September 2013 through September 2018. The impacts of conducting the Project on marine mammals are specifically related to acoustic activities, and these are expected to be temporary in nature, negligible, and would not result in substantial impacts to marine mammals or to their role in the ecosystem. Because we expect the level of effects of this project to be minor; we would require mitigation and monitoring measures to reduce the level of impact; and the specified activity is taking place in an industrial area, we do not expect that the issuance of an Authorization would have a significant cumulative effect on the human environment.

4.5.2 VESSEL TRAFFIC AND VESSEL NOISE

The project area is an important industrial region and home to the Port of Seattle, which ranked as the nation's sixth busiest U.S. seaport in 2010. Due to ongoing anthropogenic noise around Elliott Bay, the ambient sound level is estimated to be 123 dB. Vessel traffic associated with the Project would consist of a work/equipment barge and small range craft. The small range craft vessel would travel at low speeds and may be used to monitor for marine mammals in the area. Such vessels already use the area in moderately high numbers; therefore, the vessels to be used in the project area do not present a new sound source. The additional vessel traffic and noise is not expected to result in a significant increase to environmental impacts because few vessels are involved in the proposed Project and vessel noise attributed to the proposed Project would not have an incremental effect on the overall soundscape of Elliott Bay.

4.5.3 FISHING

The proposed Project is expected to increase habitats for native species and increase populations and/or densities in the surrounding area. A large part of the Project is proposed habitat enhancement in the nearshore, which would include improving the quality of substrate, adding riparian plantings, burying contaminated sediment, and adding light-penetrating surfaces to overwater structures to enhance shallow water habitats for salmonid migration. In-water work during the Project may temporarily disturb marine life from general equipment/barge presence and noise and increased turbidity. However, in the long-term, habitat enhancements may result in increased populations beyond the project area and enhance fishing and wildlife-observation opportunities. Because the proposed Project would enhance marine mammal prey species habitat, we do not expect the proposed Project to have an incremental effect on marine mammals when combined with the effects of fishing.

CHAPTER 5 – LIST OF PREPARERS AND AGENCIES CONSULTED

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CHAPTER 6 – REFERENCES

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